

1. A computer program product for performing computer graphics operations on an image represented by digital data, the product tangibly embodied in a computer-readable medium or propagated signal, the product comprising instructions operable to cause a programmable processor to:

5 receive a representation of a digital image, the image comprising drawing objects organized in a hierarchical relationship;

receive a user input defining an envelope having an outline, the envelope containing a first original drawing object in the image, the envelope being a manipulable graphic object defining a coordinate remapping, the coordinate remapping being applied to generate a  
10 resulting drawing object for any original drawing object contained in the envelope, the first original and its resulting drawing object each being a vector object;

wherein the envelope has an interior control point that is an anchor point interior to the envelope outline, the product further comprising instructions to:

15 receive a user input manipulating the interior control point and, in response, redefine the coordinate remapping.

2. The product of claim 1, wherein the interior control point is a lattice point having four tangents.

3. The product of claim 1, wherein the interior control point is not a lattice point and has two tangents.

20 4. A computer program product for performing computer graphics operations on an image represented by digital data, the product tangibly embodied in a computer-readable medium or propagated signal, the product comprising instructions operable to cause a programmable processor to:

25 receive a representation of a digital image, the image comprising drawing objects organized in a hierarchical relationship;

receive a user input defining an envelope having an outline, the envelope containing a first original drawing object in the image, the envelope being a manipulable graphic object defining a coordinate remapping, the coordinate remapping being applied to generate a resulting drawing object for any original drawing object contained in the envelope, the first

original and its resulting drawing object each being a vector object;

receive from a user a precision input signifying how closely an object contained in the envelope will follow the envelope when the corresponding resulting object is generated and, in response, introduce additional control points to the original contained object if necessary to achieve the precision before applying the coordinate remapping.

5 5. A computer program product for performing computer graphics operations on an image represented by digital data, the product tangibly embodied in a computer-readable medium or propagated signal, the product comprising instructions operable to cause a programmable processor to:

10 receive a representation of a digital image, the image comprising drawing objects organized in a hierarchical relationship;

receive a user input defining an envelope having an outline, the envelope containing a first original drawing object in the image, the envelope being a manipulable graphic object defining a coordinate remapping, the coordinate remapping being applied to generate a resulting drawing object for any original drawing object contained in the envelope, the first original and its resulting drawing object each being a vector object;

15 determine whether an original curve of the first original drawing object at an original anchor point in the envelope has C1 continuity at the original anchor point and, if it does, preserve the C1 continuity in a resulting curve in the resulting drawing object at a resulting anchor point corresponding to the original anchor point.

20 6. The product of claim 5, further comprising instructions to:

determine whether the C1 continuity is also C2 continuity at the original anchor point and, if it is, preserve the C2 continuity in the resulting curve at the resulting anchor point.

7. The product of claim 5 or 6, wherein:

the original anchor point is between two tangent handles; and

the continuity is preserved by first storing a continuity state of the original anchor point and the relative position of the original anchor point between the two tangent handles, then remapping the tangent handles in accordance with the envelope, and then relocating the anchor point between the remapped tangent handles in accordance with the stored relative position.

8. The product of claim 1 or 5, further comprising instructions to:

receive from a user a precision input signifying how closely an object contained in the envelope will follow the envelope when the corresponding resulting object is generated and, in response, introduce additional control points to the original contained object if necessary to achieve the precision before applying the coordinate remapping.

9. The product of claim 1 or 4, further comprising instructions to:

determine whether an original curve of the first original drawing object at an original anchor point in the envelope has C1 continuity at the original anchor point and, if it does, preserve the C1 continuity in a resulting curve in the resulting drawing object at a resulting anchor point corresponding to the original anchor point.

10. The product of claim 1, 4 or 5, wherein the image comprises drawing objects organized in a hierarchical relationship defined by an object list, the product further comprising instructions to:

cause a group to be created in the object list;

cause the group to be populated with all original objects contained in the envelope;

cause the group to be populated with all result objects generated in accordance with the coordinate remapping; and

cause the group to be rendered to display the result objects and not display the original objects in the envelope.

11. The product of claim 10, further comprising instructions to:

cause the group to be populated with a destination envelope.

12. The product of claim 10, further comprising instructions to:  
cause the group to be populated with a source envelope.

13. The product of claim 1, 4 or 5, further comprising instructions to:  
receive a user input requesting a meridian of constant u or v be introduced into the  
5 envelope.

14. The product of claim 1, 4 or 5, further comprising instructions to:  
receive an input requesting one or more single additional control points localized to  
portions of the envelope be introduced into the envelope.

15. The product of claim 14, wherein the additional control point is a lattice point  
10 having four tangents.

16. The product of claim 14, wherein the additional control point is not a lattice point  
and has two tangents.

17. The product of claim 1 or 5, further comprising instructions to:  
provide variable precision of distortion by introducing additional control points on  
15 one or more original curves of one or more contained objects before coordinate remapping,  
with a variable frequency of insertion that can be determined by user input.

18. The product of claim 1, 4 or 5, further comprising instructions to:  
provide for selection in a user interface multiple pre-made envelope meshes having  
interior control points, each rendered as an envelope group into a swatch with interior detail.

19. The produce of claim 18, wherein the swatch has a checkerboard pattern of two or  
20 more colors.

20. The product of claim 1, 4 or 5, further comprising instructions to:  
display for a user an option to select explicitly a focus for editing operations

performed by the user, the focus being selected from a set including at least the envelope and a source shape in the envelope.

21. The product of claim 20, further comprising instructions to:

5 display for the user an option to hid or lock the envelope or the source shape, wherein an element that is hidden or locked cannot respond when a user clicks at a control point of the element.

22. The product of claim 1, 4 or 5, wherein the envelope is a mesh.